

6. *ORIOLOUS AFFINIS* Gould (op. cit. p. 79).

Found at 1800 feet on Bellenden-Ker; common throughout North Queensland to Cape York.

7. *SPHECOTHERES FLAVIVENTRIS* Gould (op. cit. p. 84).

On Bellenden-Ker at 3000 feet, and from Cardwell to Cape York.

8. *COLLYRIOCINCLA HARMONICA* (Lath.) (op. cit. p. 88).

At 2000 feet on Bellenden-Ker. This species is a grand whistler in the morning. In Gippsland (Victoria) I have heard it mock the Lyre-birds. It is found throughout the States to the Gulf of Carpentaria. On Sweer's Island the birds seem somewhat paler than elsewhere, but are undoubtedly identical and have the same habits.

9. *COLLYRIOCINCLA BOWERI* Ramsay (op. cit. p. 92).

I shot a specimen of this bird on the Sea-View Range, and another on Bellenden-Ker at 4000 feet. This is the largest species of the genus and has a grand call-note. It ranges over Cardwell back-scrubs, Herberton (4000 feet), Bellenden-Ker, and North-west Australia.

10. *PINAROLESTES RUFIGASTER* (Gould) (op. cit. p. 93).

Found at 3000 feet on Bellenden-Ker, and all over the Cardwell district to Cape York.

11. *GRAUCALUS MENTALIS* Vig. & Horsf. (op. cit. p. 98).

Found at Granite Creek, Bellenden-Ker. This is a West-Queensland bird, and is met with at Chinchilla (380 feet) and at Port Moresby.

12. *LALAGE LEUCOMELÆNA* (Vig. & Horsf.) (op. cit. p. 104).

Found on Bellenden-Ker up to 1800 feet. Very common at all times in the scrubs near Brisbane, at Nerang Creek, and at Cardwell.

13. *MICRÆCA FLAVIGASTRA* Gould (op. cit. p. 107).

Met with on Barnard's Spur (1800 feet). Found all through the Cardwell district to Cape York, where it was first discovered by MacGillivray.

14. *RHIPIDURA ALBISCAPA* Gould (op. cit. p. 108).

Obtained at Palm Camp (4000 feet).

15. *RHIPIDURA RUFIFRONS* (Lath.) (op. cit. p. 112).

Common at 4000 feet on Bellenden-Ker.

16. *ARSES KAUPI* Gould (op. cit. p. 126).

At the pools of Bellenden-Ker, Cardwell, the mouth of the Herbert River, and in the Cape York scrubs.

17. *PÆCILODRYAS CAPITO* (Gould) (op. cit. p. 152).

One of the common birds on the top of South Peak (5000 feet), where the specimens were very small. It ranges over the coast-scrubs to Cooktown, and is one of the earliest morning songsters.

18. *MALURUS AMABILIS* Gould (op. cit. p. 176).

Found on Bellenden-Ker at 1400 feet. It extends from north of the Herbert River to Cape York, and is common in the Cardwell district.

19. *MALURUS DORSALIS* (Lewin) (op. cit. p. 179).

On Bellenden-Ker at 1800 feet. It ranges over the Cardwell district to Cooktown, but is not found at Cape York.

20. *SCENOPÆUS DENTIROSTRIS* (Rams.).

*Tectonornis dentirostris*, Campb. op. cit. p. 207.

This is one of my discoveries. I first shot a specimen at Cardwell in 1882. It is found at 5000 feet on Bellenden-Ker and all over the Herberton district (3000 feet). This bird is one of the grandest mockers in Australia. It imitates all the species in the district, and attracts them to its vicinity. Its playground consists of a space scratched clean and decorated with seven or nine large leaves laid flat upon it.

21. *PRIONODURA NEWTONIANA* De Vis (op. cit. p. 212).

I shot a young male of this bird in the Tully scrubs in 1882. In 1889, at Herberton, I found plenty of old males in their bowers and shot a good number of them and of young females. On Bellenden-Ker this species is found up

to 5000 feet, while below 3000 feet it is never seen except as a straggler. It is a grand mocker, imitating all the birds in the scrubs. It makes a great bower 8 feet high. I have never found the nest or eggs, which appear to be still unknown.

22. *SERICORNIS CITREOGULARIS* Gould (op. cit. p. 243).

Found at 3000 feet, and common on the mountains in the Brisbane scrubs. It makes a long hanging nest of moss at the end of a branch.

23. *SERICORNIS MAGNIROSTRIS* (Gould) (op. cit. p. 247).

Found at 5200 feet on Bellenden-Ker and in the Brisbane scrubs.

24. *SERICORNIS GUTTURALIS* De Vis (op. cit. p. 252).

This ground-bird was originally discovered by the writer on Bellenden-Ker at 5200 feet. It occurs also in the Herberton scrubs at 4500 feet.

25. *ORTHONYX SPALDINGI* Ramsay (op. cit. p. 252).

On Bellenden-Ker at 5200 feet, in Herberton scrubs, and over all the range from Townsville to Cooktown; it occurs on both sides of the range as far as the scrub extends, but is not found at Cape York or at Brisbane. The district just south of the Herbert River, and thence to Bloomfield, is its main resort. This is a ground-bird and makes a nest like a Lyre-bird, laying one almost round white egg.

26. *PSOPHODES CREPITANS* (Lath.) (op. cit. p. 265).

Common on the top of Bellenden-Ker (5000 feet). The examples procured were much smaller than those from Gippsland, where they are very large; but the South-Queensland form has the same call-note, makes the same nest, and has the same habits as the other.

27. *CRATICUS QUOYI* (Less.) (op. cit. p. 299).

This species ascends the mountains up to 3000 feet, and is found in the mangrove-swamps at the mouths of the creeks and rivers all along the coast from the Herbert River to Cape York.

28. *CRATICUS RUFESCENS* De Vis (op. cit. p. 303).

This is a discovery of mine. It was first found on the Barrow River, and thence sent to Ramsay, who thought that it was the young of *C. quoyi*, which, however, is entirely black. I found nestlings in Cardwell. This is a true mountain-bird, found in scrubby gullies; a pair are nearly always to be observed together. I saw it in the Mulgrave scrubs on Bellenden-Ker up to 1800 feet, and at Herberton up to 4000 feet, in June 1889. It is not found at Cape York or in the intermediate country.

29. *EOPSALTRIA CHRYSORRHOA* Gould (op. cit. p. 315).

Found at 4000 feet; the first bird to be heard in the morning. It occurs on the east coast of Queensland.

30. *HETEROMYIAS CINEREIFRONS* Rams. (op. cit. p. 317).

This is a mountain-species, found on the Sea-View Range at 4000 feet and on all the heights about Cardwell. I never saw it on the coast or in the lowlands.

31. *PACHYCEPHALA GUTTURALIS* (Lath.) (op. cit. p. 219).

One of the commonest birds on the high peaks of Bellenden-Ker, especially around our camp on South Peak (5000 feet). It is plentiful in Brisbane scrubs and at Cardwell.

32. *PACHYCEPHALA RUFIVENTRIS* (Lath.) (op. cit. p. 324).

Found on the grassy spurs of Mt. Barnard (1800 feet).

33. *CLIMACTERIS LEUCOPHÆA* (Lath.) (op. cit. p. 332).

Palm Camp (4000 feet). This species occurs nearly all over Eastern Australia and on the Herberton Range (4500 feet), where the individuals are smaller and darker in plumage than elsewhere.

34. *SITTELLA STRIATA* Gould (op. cit. p. 343).

Found at Granite Creek Camp, Bellenden-Ker (380 feet), and along the east coast from Herbert River to Cooktown.

35. *MYZOMELA SANGUINOLENTA* (Lath.) (op. cit. p. 352).

Granite Creek Camp (380 feet). This species occurs also in the Cardwell and Brisbane districts, but not at Cape York.

36. *PTILOTIS LEWINI* Swains. (op. cit. p. 386).

Common all through the mountains up to 4000 feet; also at Cardwell and Cape York. One of the most abundant birds of Queensland, especially in the Brisbane scrubs.

37. *PTILOTIS FRENATA* Ramsay (op. cit. p. 388).

This is another of my discoveries. It was first shot at Cardwell in 1882. It feeds on mistletoe, and comes to the lowlands in January, February, and March (the rainy season). In June (winter) it goes to the mountains, and sometimes reaches an altitude of 5200 feet.

38. *PTILOTIS MACLEAYANA* Rams. (op. cit. p. 389).

A species discovered by me at Cardwell in 1882. It was seen at Palm Camp (4000 feet). It is found all through the Cardwell district, but not at Cape York or south of the Herbert River.

39. *DICÆUM HIRUNDINACEUM* (Shaw) (op. cit. p. 437).

Mount Barnard (1800 feet). Common all through Queensland, Victoria, and New South Wales. It feeds on mistletoe-berries, and is the only member of its genus found in Australia.

40. *PARDALOTUS PUNCTATUS* (Shaw) (op. cit. p. 444).

This beautiful bird is abundant up to 1800 feet, while it also occurs throughout nearly all Queensland on the coast side, but not at Cape York.

41. *ARTAMUS LEUCOGASTER* (Valenc.) (op. cit. p. 461).

Common from 380 feet to 1800 feet. This species ranges from the Herbert River to Cape York on the coast, and I have also seen it in New Guinea (Port Moresby).

42. *ÆGINTHA TEMPORALIS* (Lath.) (op. cit. p. 490).

Granite Creek Camp (380 feet). Common in Brisbane.

43. *PITTA STREPITANS* Temm. (op. cit. p. 526).

Found at 3000 feet. Common at Brisbane, Cardwell, and Cape York in February.

44. *COLLOCALIA FRANCICA* (Gmel.) (op. cit. p. 532).

This beautiful little Swift is common at the base of Bellenden-Ker and up to an altitude of 1800 feet. I have seen it catching flies in the lowlands even when it was nearly dark, and then moving off towards the mountains. It breeds in the rocky gorges of the Coast Range, from the Herbert River to above Cairns, but is not found so far north as Cape York. It is most common in the low country on wet days.

45. *MEROPS ORNATUS* Lath. (op. cit. p. 545).

This Bee-eater was common on sunny days at Granite Camp (380 feet), and was also seen in June at an altitude of 1800 feet on Mount Barnard.

46. *DACELO GIGAS* (Bodd.) (op. cit. p. 551).

Found up to 2000 feet.

47. *DACELO LEACHI* Vig. & Horsf. (op. cit. p. 555).

Granite Camp (380 feet).

48. *TANYSIPTERA SYLVIA* Gould (op. cit. p. 561).

A nest was seen at 1800 feet. This bird, a true denizen of the scrub, bores into a termites' nest and lays four beautiful roundish white eggs. It delights in the gullies of the mountains, from north of the Herbert River to Cape York, during October, November, and December. It feeds its young on termites.

49. *CACOMANTIS VARIOLOSUS* (Horsf.) (op. cit. p. 572).

Found at 3000 feet on Bellenden-Ker. This handsome bird used to utter its mournful call all night, while we were shooting tree-kangaroos in the mountains. It is not found near Brisbane.

50. *CENTROPUS PHASIANUS* (Lath.) (op. cit. p. 590).

On Bellenden-Ker at 1800 feet. Found all along the east coast of Queensland, and there called the Swamp-Pheasant. It builds in low grassy flats and hatches its own eggs.

51. *TRICHOGLOSSUS NOVÆ-HOLLANDIÆ* (Gm.) (op. cit. p. 592).

I saw a small flock of these Parrakeets flying over South

Peak (5200 feet), in company with some Scaly Parrakeets (*Trichoglossus chlorolepidotus*). The bird is common all over Queensland on the coast side.

52. *CALYPTORHYNCHUS BANKSI* (Lath.) (op. cit. p. 606).

Common at 1800 feet on Bellenden-Ker. Ranges over Queensland, Nerang Creek, North Brisbane, Cardwell, and all the coast-scrubs to Cooktown. It is not found on the west side of the range.

53. *CACATUA GALERITA* (Lath.) (op. cit. p. 611).

Common on Bellenden-Ker up to 4000 feet. In the Cardwell district it feeds on palm-berries.

54. *APROSMICTUS CYANOPYGIUS* (Vieill.) (op. cit. p. 628).

Found at 3000 feet on Bellenden-Ker, as well as on the east coast of Queensland to Cooktown. It does not occur at Cape York.

55. *PLATYCERCUS ELEGANS* Gm. (op. cit. p. 629).

South Peak Camp, Bellenden-Ker, at 5200 feet. It does not occur on the west fall of the range, but only in the Warwick district in South Queensland.

56. *MEGALOPREPIA MAGNIFICA* (Temm.) (op. cit. p. 666).

On Bellenden-Ker, at Dalrymple's Gap Range; on the Clarence and Richmond Rivers, Nerang Creek, and the coast-scrubs of Queensland to Cooktown. The specimens are smaller as you get nearer to Cardwell.

57. *LOPHOLEMUS ANTARCTICUS* (Shaw) (op. cit. p. 671).

On Bellenden-Ker at 1800 feet. Ranges from Brisbane over all the intermediate country to Cape York, where the specimens are comparatively small.

58. *COLUMBA LEUCOMELA* Temm. (op. cit. p. 672).

Mr. Meston found this species breeding on the tops of fern-trees at 5000 feet on Bellenden-Ker in March. It occurs also at Cardwell and Brisbane.

59. *MACROPYGIA PHASIANELLA* (Temm.) (op. cit. p. 674).

Found on Bellenden-Ker at 4000 feet. It ranges all along the east coast to Cooktown, but is not found at Cape York.

60. *CHALCOPHAPS CHRYSOCHLORA* (Wagl.) (op. cit. p. 679).  
Found at 3000 feet on Bellenden-Ker. Occurs from Brisbane to Cape York.

61. *CATHETURUS LATHAMI* (Lath.) (op. cit. p. 708).  
Nests up to 3000 feet on Bellenden-Ker.

62. *MEGAPODIUS DUPERREYI* Less. & Garn. (op. cit. p. 715).  
At 3000 feet on Bellenden-Ker, but not found on the west side of the range. This bird makes a large mound, thirty feet in diameter.

63. *NYCTICORAX CALEDONICUS* (Gm.) (op. cit. p. 962).  
Found on Mount Sophia, Bellenden-Ker. Herbert River is the southern boundary of this bird's range. It breeds on the islands and not on the mainland. Every morning it flies to the mountains, and thence returns at night or before sun-down to the scrubs, where it feeds on fruits.

64. *CASUARIUS AUSTRALIS* Wall (op. cit. p. 1069).  
Found up to 3000 feet from north of the Herbert River to Newcastle Bay and to thirty miles south of the Cape, beyond which it does not occur; nor has it been observed on the other side of the coast-range.

## XXV.—On the various Plumages of *Buteo solitarius*.

By H. W. HENSHAW.

As it is the only raptorial bird indigenous to the Hawaiian Islands, the "*Io*," as the natives term *Buteo solitarius*, possesses unusual interest. It is true that the Marsh-Hawk (*Circus hudsonius*) has been taken on Oahu, while the Fish-Hawk (*Pandion haliaëtus*) has been observed on several of the islands; but the occurrence of the former, and probably of the latter, is purely accidental.

The Short-eared Owl (*Asio accipitrinus*) is also, and has been from time immemorial, a common resident on the islands. It is, however, almost indistinguishable from its relative of the mainland, whence it originally came; and can be separated, if at all, only by its slightly smaller size.



So that it is permissible to regard the *Buteo* as the only truly endemic Raptor.

From whatever quarter the Io originally found its way to the islands, and whatever are its nearest relatives, it is a true *Buteo*, not only in structure, but also in habits.

It is a solitary sluggish bird, sitting most of its time motionless on the low branches of trees, digesting its food or on the look out for a fresh supply. Once on the wing, it is a slow but powerful flier, alternately progressing by a few strong beats, and using the impetus thus gained to glide straight ahead on outstretched wings. Whether moving in this fashion, or circling far above the forest, the bird might readily be taken by the casual observer for quite a different species, the Red-tailed Hawk of America.

The food of the Io is preferably mice and small rats. Birds of any kind do not come amiss, when it can catch them, which is very rarely; and frequently it descends to such humble fare as large spiders or the larvæ of a sphinx-moth. I have found the stomachs of several individuals simply crammed with spiders, and the belly and thigh-feathers all gummed up with the silken webs and secretions.

The Io is not a bird of the deep forest, and rarely or never enters its recesses, but prefers open woods in which to nest, and, when hunting, frequents the edges of the forest and the clearings.

This Hawk breeds in spring, though apparently never very early, and some of the Hawaiian woodland birds are leading about their young ere the Io is ready to deposit its brown-blotched eggs in its rudely made nest.

As a rule, this *Buteo* is silent, but in the love-season its voice is frequently to be heard, as several males contend for the favour of a female. Its cries are not exactly like those of any Hawk known to the writer, although they are unmistakably Buteonine. Once mated I feel sure that the union is for life, and a given locality is almost invariably inhabited by a pair. On the other hand, the Io rarely or never hunts in pairs, and the bird is, on the whole, well named *solitarius*.

It is not, however, of the bird's general habits that I would here speak, but of its plumages, which, it would seem, have not been at all well understood. Of these there are two which are entirely distinct, viz. a light and a dark phase, each having two stages, a juvenile and an adult. So different are these phases that extreme examples might well be mistaken for different species. In life the adult of the light phase has the appearance of a white or albino Hawk; while the adult of the dark phase looks quite black or melanistic.

This dichromatism may aptly be compared with that which distinguishes the American Screech-Owl (*Megascops asio*), with its red and grey phases, since it characterizes the bird in all stages of growth, is dependent upon neither sex nor season, and mating birds may or may not be alike in colour.

The two phases of this Hawk may be described as follows:—

#### LIGHT PHASE.

*Adult stage.*—Head and hind-neck white, or buffy white, the feathers of the former with narrow blackish shaft-streaks, those of the latter tipped with large roundish spots of the same. Sides of head and neck buffy, with more or less brown; back blackish brown; rump lighter brown tinged with ochraceous; primaries blackish brown, the inner webs above the notch white; inner webs of secondaries black barred, and tipped, as are the wing-coverts, with whitish and ochraceous; tail lighter brown, with faint marblings and a wash of ochraceous; rectrices with eight or nine narrow, zigzag, more or less well-defined, blackish bars, which rarely entirely cross the whitish inner webs; under parts buff or rusty buff, with a few feathers (sometimes but one or two) on the flanks with brown shaft-streaks and small terminal spots of same. Legs and feet greenish yellow; soles light yellow; bill blackish, but plumbeous at the base of the lower mandible; iris light hazel.

*Juvenile stage.*—Above and on the sides of the head chocolate-brown, deepest on the hind-neck; the feathers lightly bordered with greyish and rusty; rectrices ashy brown, with irregular bars of blackish across each feather;